Acute Arthritis in Children “overview”

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DEFINITION

Arthritis means inflammation of a joint (or joints).

Inflammation of a joint results in accumulation of inflammatory fluid inside the joint or in thickening of the lining of the joint (called the synovium), which in turn leads to swelling of the joint.

If there is no swelling, at least two of the following three symptoms have to be present:

pain or tenderness on movement of a joint	limitation of range of movement	hotness

it's called acute arthritis when it occurs abruptly and with severe pain, heat, and an inability to move

PAIN

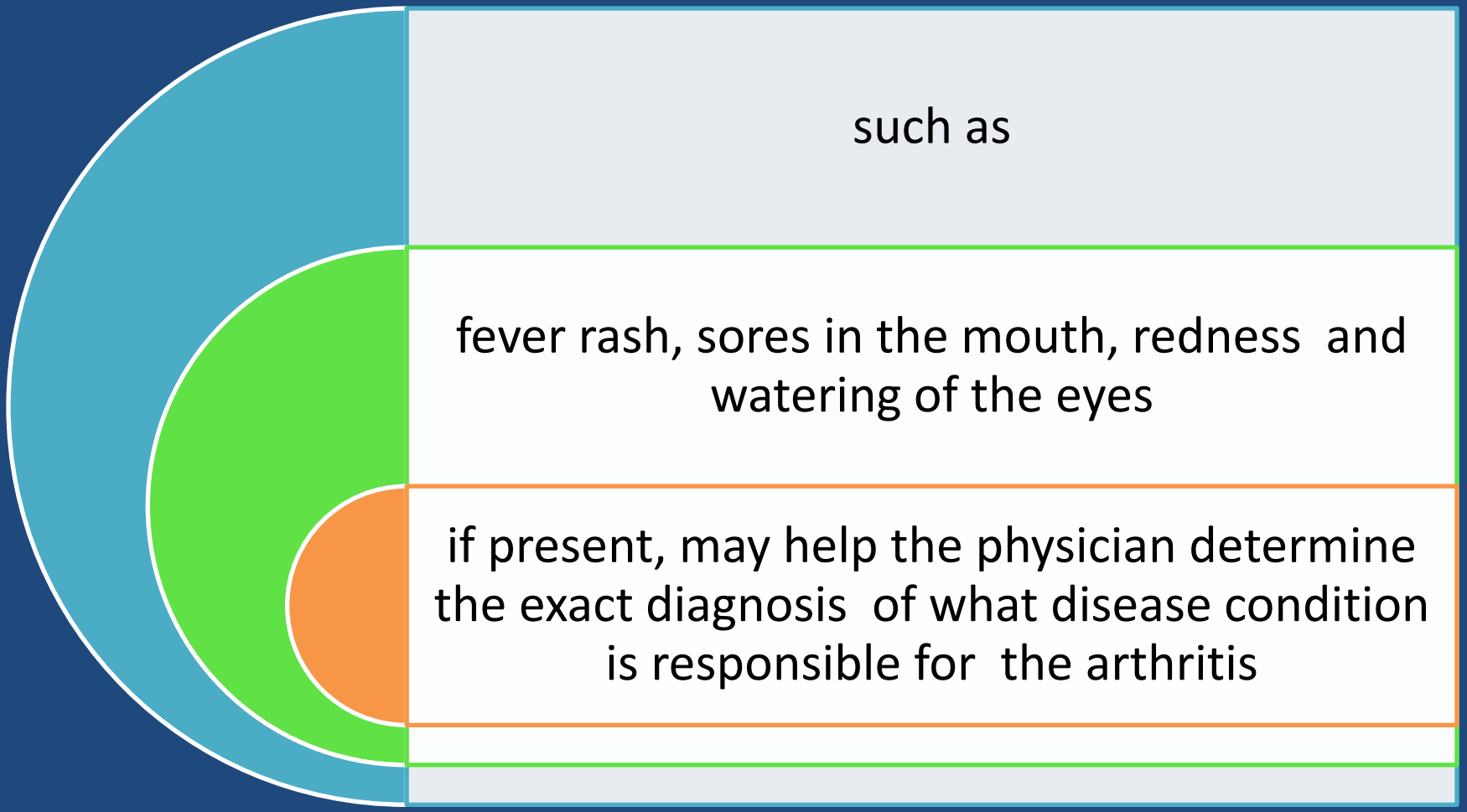
Although inflammation of a joint causes pain, pain in the joint is not always caused by inflammation.

Therefore, just because a child has pain in a joint, it does not necessarily indicate arthritis, although arthritis is one of the major and most important causes of joint pain.

common symptoms of arthritis in children:

-Pain in joints
-Swelling of joints
-Limping
-Inability to move the joint
-Holding the affected limb in one position
-Heat over the joint
-Stiffness of joints
-Irritability (in infants)
-Crying on handling (in infants)

Associated signs and symptoms



Incidence &Prevalence

The incidence per 100,000 children under 16 years of age was as follows:	
	6.7 **% for septic arthritis,**
	5.4% for enteropathic arthritis,
	51.9 **% for transient synovitis of the hip,**
	18.9% **for prolonged arthritis (duration >3 months), and**
	25.8% for acute transient arthritis.
	The incidence of juvenile Idiopathic arthritis was *19.6%.*

71% of the patients studied were seen within 1 week of the onset of symptoms.

All patients received follow-up care for at least 3 months; patients whose symptoms were prolonged received follow-up care for a minimum of 2 years.

CAUSES & D.D.

Infection-related

- Lyme disease, Septic arthritis, Gonococcal arthritis
- Parvovirus Mononucleosis , Cytomegalovirus
- Varicella , Streptococcal-associated arthritis
- Acute rheumatic fever ,Hepatitis B and C
- Endocarditis , Toxic synovitis

Malignancy

- Leukemia , Lymphoma , Bone tumors

Metabolic

- Sickle cell disease

Connective tissue diseases

- Systemic lupus erythematosus , Dermatomyositis ,Mixed connective tissue disease Vasculitis

Juvenile idiopathic arthritis (JIA)

Noninflammatory conditions

- Chondromalacia patella ,Hypermobility syndrome ,Osgood-Schlatter disease ,Sever disease

Monoarthritis Vs. polyarthritis

Arthritis in a single joint, or Monoarthritis Differential Diagnosis

Septic arthritis

–Rapid diagnosis critical: Untreated septic arthritis causes irreversible joint and bone destruction

–Usually presents hyperacutely with very tender, swollen, warm, red joint with severely restricted range of motion

–Usual pathogens:

Haemophilus influenzae type b	***Staphylococcus aureus***	***group B strep*** in neonates	***Neisseria gonorrhoeae in adolescents***	***fungal and mycobacterial arthritis are rarely seen***

*Reactive arthritis

- –Probably the most common etiology of childhood rheumatic diseases
  –Usually full resolution, but a few children have a chronic course

*Trauma, overuse, fracture

- –Often acute onset with significant pain

*Malignancy

- such as leukemia, neuroblastoma

*Pauciarticular juvenile rheumatoid arthritis (JRA)

*Spontaneous osteonecrosis of the joint

- –Mostly in hip (Legg-Calvé-Perthes disease), shoulder, and knee
  –More common in males

*Hemarthrosis

- due to trauma, bleeding disorder such as hemophilia, or benign tumors such as hemangiomas and pigmented villonodular synovitis

Transient (Toxic) synovitis (TS)

Transient synovitis (TS) is the most common cause of acute hip pain in children aged 3-10 years.

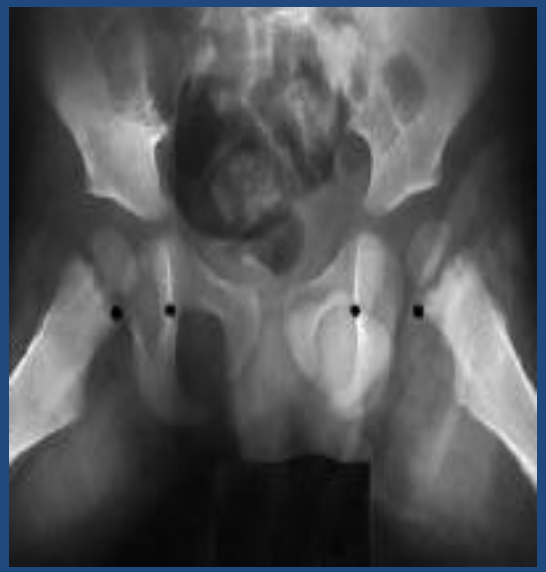
The disease causes arthralgia and arthritis secondary to a transient inflammation of the synovium of the hip.

Pathophysiology: Biopsy reveals only nonspecific inflammation and hypertrophy of the synovial membrane.

Ultrasonography demonstrates an effusion that causes bulging of the anterior joint capsule.

Synovial fluid has increased proteoglycans.

TS is one of the most common causes of joint pain in the pediatric age group.



Arthritis in a multiple joint, or Polyarthritis Differential Diagnosis

***Infectious**

- –Reactive arthritis (post enteric or genital including Reiter syndrome, post viral, post streptococcal)
- –Acute rheumatic fever (ARF): Migratory, painful; usually affects large joints; diagnosis is based on Jones criteria, which includes five major (arthritis, carditis, Sydenham chorea, erythema marginatum, subcutaneous nodules) and several minor (fever, arthralgia, elevated ESR or CRP, prolonged P-R interval) manifestations
- –Lyme disease: Arthritis is monoarticular or oligoarticular, is rarely symmetric, and is the second most common manifestation of Lyme disease after erythema migrans
- –SBE-related arthritis
- –Septic polyarthritis (unusual)

*Rheumatic

- –Polyarticular JIA: Arthritis in five or more joints in first 6 months of disease, insidious onset, symmetric involvement, may be RF+ (erosive, similar to adult RA) or RF-
  –Systemic-onset JRA: Presents with severe systemic involvement (fever, rash, serositis), which may precede the arthritis, usually oligoarticular
  –Juvenile ankylosing spondylitis (JAS): Initially affects lower extremity joints; later affects axial skeleton, also affects tendons
  –Psoriatic arthritis
  –Arthritis of IBD: Usually more transient than JRA
  –SLE: May present only with arthritis, may be misdiagnosed as JRA
  –Other connective tissue diseases (scleroderma)
  –Vasculitis (HSP, Kawasaki disease)

*Malignancy such as leukemia

*Sickle cell disease

*Medications (minocyline, carbamazapine)

*Other systemic disorders:

- Serum sickness, sarcoidosis, Behçet disease, Ehler-Danlos syndrome, mucopolysaccharidoses, Noonan syndrome, Turner syndrome

Arthritis as the main symptoms

Arthritis related to infection	Lyme arthritis Reactive arthritis Post-streptococcal, -viral arthritis
Juvenile Idiopathic Arthritis	Oligoarthritis Extended oligoarthritis RF- polyarthritis RF+ polyarthritis Juvenile spondyloarthropathy Psoriatic arthritis
Arthritis associated to other inflammatory diseases	IBD related arthritis CRMO
Sarcoid arthritis	Blau syndrome Late Onset Sarcoidosis
Miscellaneous causes of persistent arthritis	Immunodeficiency Chromosomal disorders Cystic fibrosis Foreign-body synovitis

ARTHRITIS WITH SYSTEMIC SYMPTOMS

Systemic-onset JIA	
Systemic Autoimmune Disorders	SLE Juvenile dermatomyositis Localized scleroderma Mixed connective tissue disease
Monogenic Auto inflammatory Diseases	FMF CINCA/NOMID syndrome PAPA syndrome DIRA syndrome CANDLE syndrome Majeed syndrome PLAID/APLAID syndrome HOIL-1 deficiency
Other entities with arthralgia/arthritis and systemic inflammation	Idiopathic lobular panniculitis Pachydermoperiostosis Familial infantile cortical hyperostosis Goldbloom syndrome Secondary hyperostosis Ocular inflammatory disease Relapsing polychondritis

ARTHRITIS WITH NON INFLAMMATORY DISEASES

Arthritis in non-inflammatory diseases	**Bone and cartilage dysplasias**	Achondroplasia Spondyloepiphyseal dysplasias CACP syndrome
	Metabolic storage disorders	Mucopolysaccharidoses and mucolipidoses Sphingolipidoses
	Benign tumours of soft tissue	Synovial haemangioma Pigmented villonodular synovitis Synovial chondromatosis

AGE OF ONSET IN RELATION TO PATTERN OF FEVER

Age	Prolonged fever	Recurrent fever
First year of life	SoJIA (mostly girls)	MKD
	Kawasaki disease	CINCA / NOMID
		Cyclic neutropenia
Between 1 and 5 years	SoJIA	MKD
	Kawasaki disease	FMF
	Behçet's disease	TRAPS
		PFAPA
After 5 years	SoJIA	MKD
	Behçet`s disease	FMF
	Polyarteritis nodosa	TRAPS
	Other vasculitides	MWS
	Connective tissue diseases	FCAS
	Inflammatory bowel disease	
	Castleman`s disease	
	Histiocytosis	

Evaluation

History

- –Acute or chronic
  –Mechanical (pain worsens with activities, improves with rest, and usually involves weight-bearing joints)
  –Inflammatory (waxing and waning, symptoms unrelated to use, morning stiffness)
  –History of trauma
  –Night-time symptoms
  –Attempted treatments
  –Unusual exposures such as tick bites
  –Systemic symptoms such as fever, weight loss, rash, and fatigue
  –Mouth and/or genital ulcers, abdominal pain, vomiting, diarrhea, bloody stools
  –Past medical history: Birth history, existing medical conditions, surgeries, broken bones, growth and development, any recent URI, genital infection or strep infection, unusual exposures such as tick bites

Special attention should be paid in evaluation of an adolescent to these :

- **Age at menarche**
- **Is the patient skeletally mature? (A rough guide: is shoe size changing with every new pair?)**
- **Is the patient sexually active?**
- **Have there been prolonged or recurrent school absences?**
- **Are there barriers at school that make participation or attendance difficult?**
- **Has there been uninterrupted participation in physical education?**
- **Is there a history of participation in athletics?**
- **Does the patient have a best friend with whom to share arthritis issues?**
- **Have vocational and career goals been identified?**
- **Has a disability/Supplemental Security Income application been filed**

Physical exam :

- –Vital signs including growth parameters
  –Musculoskeletal exam for swelling, tenderness, warmth, redness over the joints, range of motion of the joints; asymmetry, muscle strength
  –Lympadenopathy, organomegaly, rash, dysmorphic features, presence of bone pain and neurologic exam (tone, sensory, and reflexes)

Radiology:

- CXR, X-ray of involved joints, US, MRI, and bone scan to rule out infection, malignancy, and to confirm effusion and tenosynovitis

Lab investigation :

- may include CBC, ESR, CRP, examination of synovial fluid, Lyme titers, RF, and ANA, lupus panel, complement (C3, C4) levels; viral titers (HCV, EBV, parvovirus), LDH, U/A.

Studies:

- ECG, echocardiogram, angiogram, UGI/SBF, endoscopy when clinically indicated

Treatment

***Non-pharmacological:**

- Physiotherapy
- Occupational therapy
- psychotherapy

Pharmacological Treatment

Treatment of the cause

- **Antibiotic in infective causes**
- **NSAID e.g. Naproxen20 mg/kg/d 10 mg/kg/dose bid up to 1000 mg/d Ibuprofen40 mg/kg/d 10 mg/kg/dose qid up to 2400 mg/d**

***Appropriate referral and treatment for malignancy**

***JIA and SpA**

- **are usually treated with NSAIDs initially, DMARDs (e.g., sulfasalazine and methotrexate) and biologics (e.g., TNF blockers) are added depending on the degree of inflammation and the response of individual patient**

***Corrective and/or supportive medical/surgical interventions**


Thank You